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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Krysiak et al.

Serial No.: 09/544,878

Group Art Unit: 3643

Filed: April 7, 2000

Examiner: Valenti, A.

For: SEEDING TREATMENTS

Box Response
Assistant Commissioner for Patents
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION

Sir:

This is in response to the Office Action mailed October 22, 2001.

In the Claims

Please add the following new claims:

GROUP 3600
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19. A method of making seed capsules in a single apparatus by a tumbling/agitation agglomeration operation comprising:
preconditioning said seed with a binding agent while tumbling said seed;
conditioning said seeds by tumbling said seed in a bed of fine particulate to create layers of matter about said seed.

20. The method of claim 19 wherein said preconditioning comprises spraying a precoated material on said seed and subsequently driving off any binding agent used to apply said particulate layers on said seed.

21. The method of claim 19 wherein said seeds are fed continuously into said apparatus.

22. The method of claim 19 wherein said preconditioning and conditioning steps are repeated to add additional layers to said seed.

Please cancel claims 1-3.

RESPONSE

Applicant has added new claims 19-22 and cancelled claims 1-3

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The Examiner has rejected claims 1-3 and 17 and 18 under 35 USC 102 as being anticipated by US Patent 4,250,660, Kitamura. The Examiner states that Kitamura discloses a method of encapsulating seed by an agglomeration operation using agitating and tumbling to wrap seeds with layers of fine particles and prior to agitation and tumbling the seed is sprayed with a binding agent. The agitating and tumbling overcomes the natural tendencies of the material fines to bind to one another. Regarding claim 17, the Examiner states that Kitamura teaches that a fluidized bed is the apparatus used in the method.

The Examiner states that Kitamura teaches the method of coating seeds using a surface treated coating powder that was treated by a water soluble binder and that the surface treated coating powder is bonded to the seed with additional water-soluble binder thus becoming an integral part of the seed. Kitamura teaches that growth hormone compounds and fungicides can be added to the coating thus improving germination and establishment performance.

The Examiner maintains that Kitamura discloses an agitation agglomeration process as claimed. The Examiner states that agitate is defined as "to give motion to" and "to move with an irregular, rapid, or violent action". Agglomeration is defined as "the action or process of collecting mass". The Examiner states that Kitamura's process of coating seeds with a coating powder is inherently an agitation agglomeration process utilizing a centrifugal fluidized or fluidized bed coating machine and the like. Kitamura teaches that the surface-treated coating powder is created. Then the seeds are tumbled and sprayed with the binding agent and the coating then adheres to the surface of the seed encapsulating the seed.

Kitamura teaches a means to precondition a coating agent that, when applied to a seed, has properties that improve disintegration when applied, are more firm so the coating does not fall off during handling, and that creates a harder surface coating on the seed. Kitamura relates to a process for coating seeds, which is obtained by surface treating a coating powder and then coating seeds with the surface-treated coating powder. The coating powder is previously treated with a water soluble binder.

The claims of the present invention do not teach wetting and then drying the coating agent. The present invention teaches that the coating becomes an integral part of the seed.

Kitamura teaches a process to produce coated seeds using a preconditioned coating material. Although the process of Kitamura results in ease of mechanical sowing and handling and long term storage, it does not improve germination/establishment performance.

The process of Kitamura is a coating process that coats a seed with a preconditioned coating material that requires a coating machine. Coating machines are a liquid agglomeration process, not an agitation agglomeration process as claimed in the claims of the present invention. The machines and the processes are different. Sugar

coating machines which are described by Kitamura are widely used in the pharmaceutical and food industries. They are also used for roasting and heating beans and edible nuts or seeds. Heat is applied to the pan as it rotates to cause a layering effect. Again, this is a coating technique, not an agitation technique. The fluidized bed in Kitamura is also being used for a coating technique and not as an agitation technique as described in the present invention.

In the process, an aqueous solution of a water-soluble binder is mixed with the coating powder, and the mixture dried by heating to obtain a solid substance. The solid substance is powdered and then used for coating seeds. In carrying out the surface treatment, the method of treating uses a slurry comprising the powder, binder and water by a spray-drier, or methods using a Henschel mixer or kneader are properly selected.

The coating machines include for example, sugar coating machines, centrifugal fluidizing coating machines, fluidized bed coating machines and the like.

Example 1 describes coating the seeds of petunia by placing them in a sugar-coating pan and tumbling with surface treated diatomaceous earth by alternate addition of diatomaceous earth while aqueous solution having CMC is sprayed thereon.

The type of machines described by Kitamura are coating machines for a liquid agglomeration process, not an agitation agglomeration process as claimed in the claims of the present invention. The machines and the processes are different. Therefore Kitamura does not anticipate or make obvious the claims of the present invention.

The Examiner has rejected claims 1-3, 6 and 18 under 35 USC 102 as being anticipated by US Patent 4,465,017 to Simmons. The Examiner states that Simmons discloses a method of wrapping a nucleus/seed in a layer of fine particles by agitating and tumbling the seeds with a material fine in an agglomeration apparatus and the apparatus overcomes the natural tendency of the material fines to bind one another in a rotary drum agglomerator. Simmons discloses that prior to agitation and tumbling the seed is sprayed with a binding agent.

Simmons relates to a seed coating machine comprising an upper mixing drum wherein a liquid adhesive coating is applied to seed and where the rate of application is regulated by a valve controlled by the seed feeder. The coated seed is dried to a state of tackiness and passed to a second, and distinctively different lower mixing drum. Because Simmons adds the liquid adhesive in the first drum and the powders in the second drum, Simmons cannot add additional layers to the seed once the seed leaves the second drum. A variety of powders are applied onto the tacky seed after being mixed and sifted in a screen distributor. The resulting coated seed has an outer powder layer which adheres to the inner adhesive coating.

Seeds are coated with a first material such as latex water composition. The moisture content of the latex coating is adjusted until the seeds are tacky. The tacky surfaced seeds are then coated with a dry superabsorbant chemical powder. The

superabsorbant is added as a powder which adheres strongly to the tacky latex coating of the seed. Fungicides and nutrients may be mixed with the superabsorbant powder prior to being coated onto the tacky seed. The water and superabsorbant forms a thin layer of water laden gel around the seed. Col. 2 lines 6-7.

Simmons does not teach making seed capsules in a single apparatus by a tumbling/agitation agglomeration operation. Nor does Simmons teach a continuous process for adding additional layers to the seeds.

The examiner has rejected claims 4, 6 and 9 under 35 USC 103 as being obvious over Kitamura in view of US patent 5,126,203, Ritzer.

The Examiner states that Kitamura is silent on the pan pelletizer, a flow jet mixer or a rotary drum agglomerator, but that Ritzer teaches a mixer agglomeration method with binder agent using a pan pelletizer, a rotary drum agglomerator, or a flow jet mixer.

The Examiner states that it would be obvious to modify the agglomeration method of Kitamura with the apparatuses of Ritzer since applicant does not present a criticality for a particular device in the specification and these are alternate equivalent apparatuses that perform the same intended function. One would select a pan pelletizer, a rotary drum or a flow jet mixer to satisfy different economic and time parameters and different types of fertilizer or nutrient coatings.

The Examiner states that Ritzer discloses old and well-known equipment for an agglomeration method of agitating and tumbling including an inclined pan or disk, rotary drum agglomerator, paddle mixer, plug mixer or flow mixer. These apparatuses are obvious equivalent means for applying the surface treated powder coating of Kitamura since they perform the same intended function of agglomerating, adding mass, to the surface of a substance, seed.

The Examiner states that the applicant does not describe in the specification the method step of preselecting the core seed.

Ritzer relates to a mixer agglomeration method. The process of the present invention teaches pre-selecting the core seed. General agglomeration methods as taught by Ritzer teach that particles are randomly binded together. The combination of Kitamura and Ritzer would not make the present invention obvious. Kitamura would yield the same results as Ritzer, a random agglomeration of multiple seeds with multiple granules of coating materials, thistle balls.

Ritzer relates to deactivation of spent silicon powder. The process for stabilizing residual silicon comprises: pelletizing the residual silicon and impregnating the pellets with an organic binder. There is no nucleus or seed which is wrapped in the layers of fine particles. In Ritzer, the silicon powder is pelletized, but there is no nucleus or seed involved.

Therefore, Kitamura in view of Ritzer does not make the claims of the present invention obvious. The claims of the present invention relate performing a tumbling/agitation agglomeration process to wrap layers of fine particulate around a seed. The combination of Kitamura and Ritzer does not teach this process nor make it obvious.

The Examiner has rejected claims 5, 8 and 12 under 35 USC 103 as being unpatentable over Kitamura in view of US Patent 2,815,376 to Knowlton and Frigmaires Engineers Inc. Internet Products Home Page.

The Examiner states that Kitamura is silent on the paddle mixer, the powder and the ribbon mixer apparatus. Knowlton teaches that the paddle mixers and ribbon mixers are well known agitation coating mixing apparatuses, but is silent on the powder mixer. Frigmaires Engineers Inc. discloses that powder mixers and ribbon mixers are equivalent mixers. The Examiner states that it would have been obvious to modify the coating method of Kitamura with the mixers of Knowlton and Frigmaires since applicant did not indicate criticality of any mixer and these mixers are alternate equivalent methods that perform the same intended function. These mixers are well known and one skilled would select a paddle, powder or ribbon mixer to satisfy different economic and time parameters and different powder applications.

The Examiner states that Knowlton and Frigmaires teach alternate equivalent mixing machines, and these are old and well known machines for mixing and it would have been obvious to modify Kitamura with the mixers of Knowlton and Frigmaires. Knowlton teaches that paddle and ribbon mixer are used as an agitation means to coat granules with a solution of urea.

Again as indicated under Ritzer, by using the coating method of Kitamura with the mixers of Knowlton and Frigmaires, a user would get thistle balls, as there is no means for preselecting the core seed.

Knowlton, 2,815,376, relates to production of urea in granular form. The process comprises introducing into an agitated mass of substantially dry particulate urea a concentrated solution of urea at a temperature a little higher than its set point while continuing the agitation of the mass until granules are obtained, then drying. There is nothing in Knowlton which teaches using the devices for wrapping a seed in layers of fine particulate. Knowlton specifically teaches creating granules from urea.

Frigmaires describes a ribbon blender/powder mixer suitable for homogenous mixing of dry powders of different bulk densities used in food, mineral, pharmaceutical, paint and chemical industries. Frigmaires does not teach using the ribbon mixer or powder mixer to perform a tumbling/agitation agglomeration to wrap layers of fine particulate around a seed.

Therefore, the combination of Kitamura with either Frigmaires or Knowlton does not make the claims of the present invention obvious.

The Examiner has rejected claims 13 and 15 under 35 USC 103 as being unpatentable over Kitamura in view of Mars Mineral Internet Products Home Page. The Examiner states that Kitamura is silent on a pin mixer or pin type mixer. Mars Mineral discloses a pin mixer well known in the art for agglomeration applications. The examiner states it would have been obvious to modify Kitamura's agglomeration method with the Mars apparatus since the pin/pin type mixer is an alternate equivalent agglomeration apparatus that performs the same intended function. These mixers are well known in the art and one skilled would select a pin/pin type mixer to satisfy different economic and time parameters and different powder applications.

The Examiner states that Mars pin mixer is a machine utilized for agitating and tumbling particles for agglomeration and the machine specs indicate that the pin mixer is a processor designed for mixing or for micro-pelletizing. Therefore, it is an obvious alternate equivalent machine.

Again as indicated under Ritzer, by using the coating method of Kitamura with the mixers described by Mars, a user would get thistle balls, as there is no means for preselecting the core seed.

The Mars Mineral Pin Mixer is a pin-type solids processor for mixing or micro-pelletizing. It is a high speed, conditioning and micro-pelletizing device that converts dust into small agglomerates through a high speed rotor shaft and pin assembly and the addition of liquids such as water, binders, oil or surfactants. Materials agglomerated in the Pin Mixer include: carbon black, cement kiln dust, pigments, coal dust, pesticides, electric furnace baghouse dust, limestone fines, graphite, coke, petroleum coke fines, bauxite and silica fume.

As a fine spray of liquid is added at the entry section and distributed throughout the powder, fine mixing and mixer agglomeration occur. The end result is a wetted, agglomerated and densified micro-pellet.

Mars Mineral specializes in agitation pelletizing. This is a process that converts fine dusts and powders into spherical shaped pellets. Pelletizing is defined as an agglomeration process whereby an amorphous mass of finely divided particulates, such as dust, powder, fume, is formed into a pellet, a ball or granule in the presence of moisture added during the process.

The pin mixer described by Mars does not teach using the pin mixer to perform a tumbling/agitation agglomeration to wrap layers of fine particulate around a seed. There is no seed taught by Mars. Therefore, the combination of Kitamura and Mars does not make the claims of the present invention obvious.

The Examiner has rejected claim 7 under 35 USC 103 as being unpatentable over Kitamura in view of US Patent 6,202,346 to Lyons.

The Examiner states that Kitamura is silent on a horizontal pan. Lyons discloses a seed coating method and that the industry standard for coating is pan-type arrangements including the horizontal pan. The Examiner states that it would have been obvious to modify the seed coating method of Kitamura with the apparatus disclosed by Lyons since the horizontal pan is an alternate equivalent agglomeration apparatus that performs the same intended coating function. The horizontal pan is well known and one skilled would select the horizontal pan to satisfy different economic and time parameters and for different powder applications.

The Examiner states that the pan-type mixer of Lyons is an alternate apparatus to that taught by Kitamura. Lyons teaches that the pan-type mixer is used to apply a particulate coating to a seed and that the pan-type mixers are well known in the field of seed coatings. It would be obvious to look to a pan-type mixer for modification of Kitamura.

Lyons teaches a coat that is a polymer and dry particulate combined material that is thinly placed around each seed. The process taught by Lyons is a liquid coating that cures to become the coat. This differs from the process described in the present invention. Again as indicated under Ritzer, by using the coating method of Kitamura with the mixers of described by Lyons, a user would get thistle balls, as there is no means for preselecting the core seed.

Lyons relates to seed coatings comprising limestone or other water insoluble particulate matter. The coatings make the seed size desirable. The current industry standard for coating alfalfa seeds is place coating on seed in an amount based on 33% of weight of seed. Coatings have been applied using a rotary drum method where a seed is tumbled while coating is sprayed on and a stream of hot air is directed at coated seeds. Other coating methods include pan-type arrangements known in the art. Lyons teaches a thin seed coating. Preferred coating procedure is a continuous coating machine. Lyons describes a liquid coating process and not a agglomeration operation comprising agitating and tumbling seeds with fine particulate in an apparatus for agglomeration which wraps layers of fine particulate around the seed.

Therefore the combination of Kitamura and Lyons does not make the claims of the present invention obvious.

Claim 10 is rejected under 35 USC 103 as being obvious over Kitamura in view of US Patent 5,130,171 to Prud'Homme. The Examiner states that Kitamura is silent on a planetary mixer. Prud'Homme discloses a planetary mixer used in a seed encapsulating method. The Examiner states that it would have been obvious to modify the coating method of Kitamura with the apparatus of Prud'Homme since the planetary mixer is an alternate equivalent apparatus that performs the same intended function in the coating process. The planetary mixer is well known in the art and one skilled would select the mixer to satisfy different economic and time parameters and for use in two coating operations.

Prud'Homme teaches a planetary mixer for encapsulating particles. Although Prud'Homme is silent on seeds in particular, it would be obvious to look to the apparatus of Prud'Homme for modification of Kitamura since it performs the same intended function of adding mass to a substance particle.

Prud'Homme relates to another liquid application process. Again as indicated under Ritzer, by using the coating method of Kitamura with the mixers described by Prud'Homme, a user would get thistle balls, as there is no means for preselecting the core seed.

Prud'Homme relates to encapsulating particles of active substance by spraying them with a thermoplastic silicone copolymer in solution in an organic solvent or in an aqueous dispersion or emulsion and removing the solvent or water by drying with hot air. The spraying/drying process is, i.e., Wurster process. The active substance may be a catalyst, perfume, colorant, cosmetic product, medication, plant protection product or plant seeds. Prud'Homme describes a liquid coating process and not a agglomeration operation comprising agitating and tumbling seeds with fine particulate in an apparatus for agglomeration which wraps layers of fine particulate around the seed.

Therefore the combination of Kitamura and Prud'Homme does not make the claims of the present invention obvious.

The Examiner has rejected claims 11, 14 and 16 under 35 USC 103 as being unpatentable over Kitamura in view of US Patent 5,891,246 to Lund.

Kitamura is silent on a cone mixer, vertical mixer or a cone pelletizer. Lund discloses a seed coating apparatus that use a cone mixer. The Examiner states that applicant did not define a cone pelletizer and vertical mixer. Lund's apparatus discloses a vertical mixer since the coating apparatus of Fig. 1 has a vertical orientation and it discloses a cone pelletizer since it performs the step of pelletizing and has a cone shape configuration. The Examiner states it would have been obvious to modify the method of Kitamura with the apparatus of Lund since they are alternate equivalent apparatuses that perform the same intended function. These agglomeration apparatuses are well known in the art and one skilled would select a vertical mixer or cone pelletizer/mixer to satisfy different economic and time parameters and for different types of fertilizer or nutrient coatings.

The Examiner states that Lund discloses a cone mixer, vertical mixer or cone pelletizer are well known seed coating apparatuses and it would be obvious to look to Lund to modify Kitamura since they are alternate equivalents that perform the same intended function of agglomerating a seed.

Lund again relates to a liquid coating application. Again as indicated under Ritzer, by using the coating method of Kitamura with the mixers of described by Lund, a user would get thistle balls, as there is no means for preselecting the core seed.

Lund relates to a seed coating apparatus for applying a coating fluid to seeds, consisting of a seed input, housing connected having seed output, rotating seed dispersing member, moving air curtain which keeps coating fluid in a rotating fluid dispenser. The fluid is dispersed vertically. Lund describes a liquid coating process and not a agglomeration operation comprising agitating and tumbling seeds with fine particulate in an apparatus for agglomeration which wraps layers of fine particulate around the seed.

Therefore the combination of Kitamura and Lund does not make the claims of the present invention obvious.

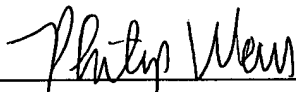
The Examiner has rejected claims 4, 5 and 7-17 under 35 USC 103 as obvious over Simmons. The Examiner states that Simmons is silent on various apparatuses. However, the Examiner states that these apparatuses are old and well known seed coating or mixing machines. The Examiner states that it would be obvious to modify the teachings of Simmons with any of the machines listed in the claims since these are merely alternate equivalent agglomeration machines that perform the same intended function of agglomerating particles with a coating and one would select a particular agglomeration machine to satisfy different economic and time parameters and to accommodate different types of fertilizer or nutrient coatings.

As stated above, Simmons does not teach making seed capsules in a single apparatus by a tumbling/agitation agglomeration operation. Nor does Simmons teach a continuous process for adding additional layers to the seeds.

Applicant believes the application is now in condition for allowance.

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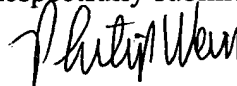
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